

WHAT IS CLAIMED IS:

1. A method of determining a stray radiation condition in a lithographic projection apparatus with a projection system having numerical aperture NA, the method comprising:

supplying a projection beam of radiation having wavelength λ ,

patterning said projection beam according to a pattern comprising a predetermined feature;

projecting said patterned beam onto an image plane to create an image of said predetermined feature,

providing a detector, having a detector aperture, in a path traversed by said projection beam;

positioning said detector aperture into a position which is substantially coincident with the image plane, wherein an expanded area obtained by a notional dilatation over a distance of at least λ/NA of said detector aperture is covered by said predetermined feature image;

measuring detected radiation intensity, and

calculating a coefficient representative of the stray radiation condition of said projection system based on said measured radiation intensity.

2. A method according to Claim 1, wherein said calculation of said stray radiation condition coefficient is further based on a reference signal representative of radiation intensity in the image plane in the absence of a pattern.

3. A method according to Claim 2, wherein said predetermined feature is an isolated area that contrasts with an area of the pattern comprising said isolated area.

4. A method according to Claim 3, wherein shape of said predetermined feature image is congruent to shape of the expanded area, and wherein said positioning further comprises an alignment step for angularly aligning said detector aperture with said isolated area.

5. A method according to Claim 4, wherein said alignment step further comprises a centering step for laterally centering said detector aperture with respect to the image of the isolated area.

6. A method according to Claims 5, wherein said isolated area is a substantially square area.

7. A method according to Claims 6, wherein said pattern comprises a plurality of isolated areas for measuring a corresponding plurality of stray radiation parameters.

8. A method according to Claim 7, wherein said pattern comprises a plurality of substantially square isolated areas for measuring a corresponding plurality of stray radiation parameters.

9. A method of determining a stray radiation condition in a lithographic projection apparatus with a projection system having numerical aperture NA, the method comprising:

supplying a projection beam of radiation having wavelength λ ,

patterning said projection beam according to a pattern comprising a plurality of features;

projecting said patterned beam onto an image plane to create an image of said plurality of features,

providing a detector in a path traversed by said projection beam, said detector having a detector aperture comprising a plurality of transmissive areas that correspond to said plurality of features;

positioning said detector aperture into a position which is substantially coincident with the image plane and wherein the image of said plurality of features covers a corresponding plurality of expanded areas of said detector aperture obtained by

a notional dilatation over a distance of at least λ/NA of said plurality of transmissive areas;

measuring detected radiation intensity, and
calculating a coefficient representative of the stray radiation condition of said projection system based on said measured radiation intensity.

10. A lithographic projection apparatus comprising:

a radiation system that supplies a projection beam of radiation having wavelength λ ;

a support structure that supports a patterning device configured to pattern said projection beam based on a desired pattern;

a substrate table for holding a substrate;

a projection system, with a numerical aperture NA, that projects said patterned beam onto a target portion of said substrate and to create an image of the pattern;

a detector provided with a detector aperture containing one or more transmissive areas in accordance with the image of one or more features of said pattern, wherein the image of said one or more features is substantially congruent to one or more expanded areas of said detector aperture obtained by a notional dilatation over a distance of at least λ/NA of said one or more transmissive areas;

a memory device to store parameters representative of stray radiation, and

a processor to calculate a stray radiation condition of said projection system.

11. A lithographic projection apparatus according to Claim 10, wherein said detector is provided on said substrate table.